

## Chapter 6

# Saving Land with a Spade: Human Landscape Transformations in the Madagascar Highland

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Many modern maps of Madagascar, at least those focused on the themes of conservation, show the central highlands as a blank spot or in a single shade of colour (aside from a few dots for cities and lines for roads). The rim of the island is where the maps become interesting: vegetation zone maps show all manner of forests, woodlands and deforested zones; ecotourism maps show a ring of protected areas. It is unfortunate that the highlands are left largely blank, as a large swath of undifferentiated grassland with few protected areas, for this glosses over the wide variety of human landscapes found throughout the highland hills, valleys and plains.

Highland farmers and herders – the *tantsaha* – have transformed the region’s landscapes over the centuries, first through fire and cattle herding, which expanded the extent of grasses at the expense of woody vegetation, and then through the labour and sweat of spade (*angady*) work: creating rice paddies, planting crops, tilling fields and digging ditches. Implicit in some conservation discussions of the region – in the way the highlands are left blank on the map – is an important critique of the loss of natural environments, or a concern over environmental degradation wrought by the *tantsaha*’s landscape manipulations. Yet to the *tantsaha*, many of these changes are positive. One way in which highland farmers refer to land newly converted to agriculture is ‘*tany vonjena*’. Literally translated, this phrase means ‘land being saved (or rescued)’.<sup>1</sup> Unsurprisingly, the process of agricultural expansion has a different meaning to the *tantsaha* – it is their livelihood, after all – than to conservationists concerned about habitat loss.

This chapter seeks to understand landscape change in the highlands from a *tantsaha* perspective. It seeks figuratively to fill in the blank spot on the map and provide a different story of change. To do so, I identify five general landscape types that reflect different stages of peoples’ shaping of the land: (1) pre-human landscapes, (2) open landscapes, (3) saved landscapes, (4) productive landscapes and (5) institutional landscapes. Each tells one about the patterns of landscape use – shaped by ecology, by livelihood needs, by politics – and about the processes of landscape change. These landscape types allow one to talk about the changes that have occurred in the highlands over centuries of settlement, as well as about

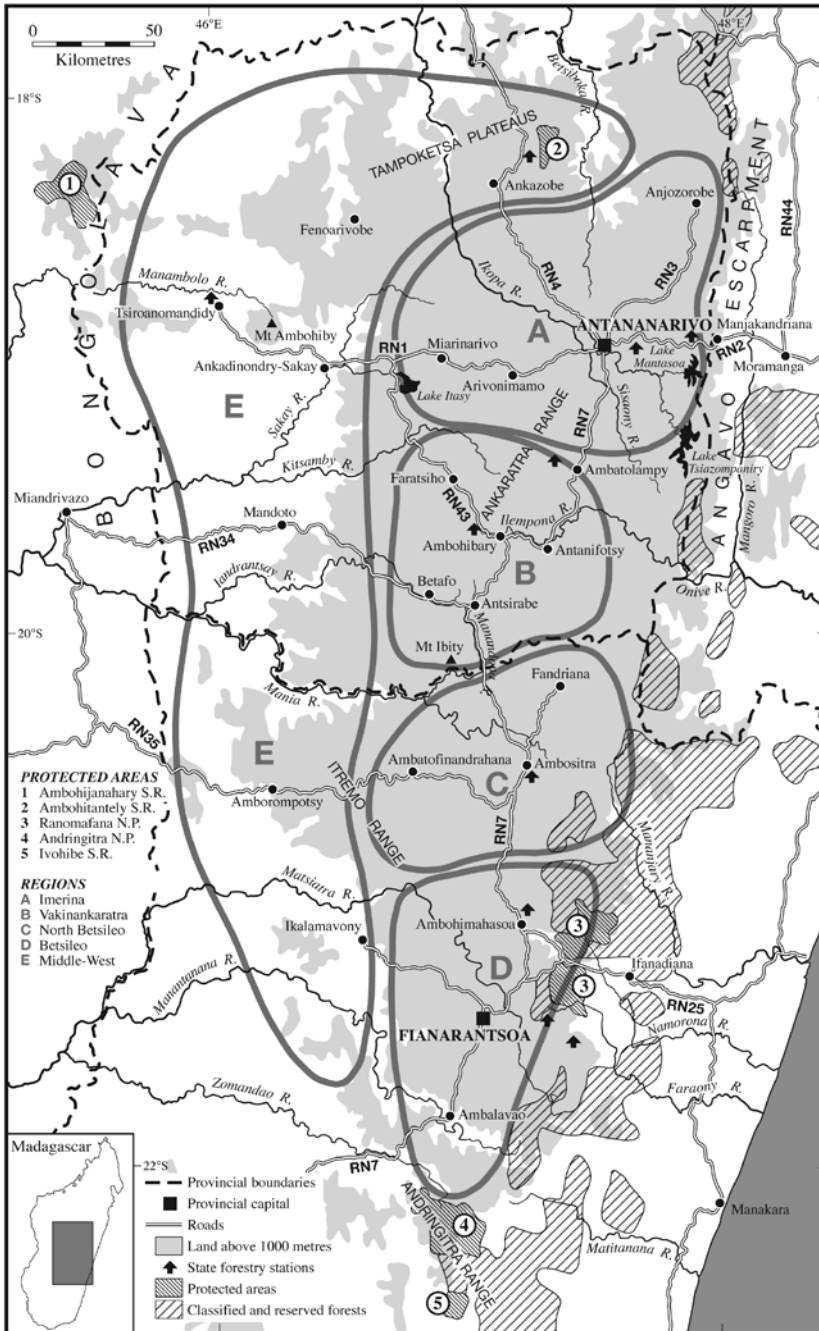
different contemporary landscapes and shorter-term trends in specific locations. Before discussing and illustrating each of these landscape types, however, some background on highland Madagascar is warranted.

## The Central and Southern Highlands

This chapter concerns the central and southern highlands, a region most simply defined as the lands over about 1 000 metres in altitude in Antananarivo province and adjacent portions of Fianarantsoa province (Figure 6.1). The hilly north-eastern portion, centred around the capital, is known as Imerina, or the land of the Merina people, one of the two dominant, closely related highland cultural groups. The mountainous southern portion, wholly in Fianarantsoa province, is home to the Betsileo, the other dominant cultural group. In between, the Vakinankaratra (split by the Ankaratra Mountains) is largely Merina in culture, but sees itself as a separate region due to its cooler climate and separate political history. To the west of these three relatively crowded regions lies a vast area of generally more gentle topography and of recent human settlement by farmers and herders from not just Merina and Betsileo origins, but from all over the island. This is the *Moyen-Ouest*, or middle-west.

Physically, highland landscapes are quite diverse. Around the capital, in Imerina, rolling hills and large plains dominate. To the north, the *tampoketsa* plateaux drop steeply into deep river valleys. To the west of the capital (around Lake Itasy) and around Antsirabe one finds clusters of volcanic domes and cones. The basaltic Ankaratra range; the quartzite, granite and marble of the Ibity and Itremo ranges; and the granitic relief of much of Betsileo country create a vertical landscape of steep slopes and deep valleys in much of the highlands south of Imerina. In the extreme south, the large basin of Ambalavao is surrounded by granitic inselbergs and high mountain ridges. Finally, in the middle-west, gentler plains are dissected by a dendritic drainage network and isolated mountains. Aside from rich alluvium in floodplains, much of the region's landscape is covered in red ferallitic soils.

The highlands have been settled for about 1 000 years. Beforehand, as far as we can tell from sediment cores and archeological investigations, the region was quite different in its vegetation cover (and in its chief inhabitants – large lemurs, elephant birds and pigmy hippopotamuses). During the last ice age, up to 17 000 years ago, the highlands were dominated by heath-like vegetation, or ericoid bushland with composites and grasses, vegetation found today only on high mountain tops. As the climate warmed, a mosaic of wooded grasslands and woodlands – with dense forest in riparian zones and mountain hollows – displaced the heath. Around 4 000 years ago, however, temperatures cooled slightly, allowing more moisture retention, and trees expanded at the expense of remaining savannahs. Lightning fires and the presence of large mega-fauna, however, helped maintain clearings and grassy cover in the woodlands and wooded savannahs.<sup>2</sup>



**Cartography** Gary Swinton

**Map 6.1** The central and southern highlands of Madagascar. Note that the regions A through E are geographical and cultural regions (discussed in the text); they do not correspond with the administrative 'régions' created since 2002.

Sometime in the first millennium, people began exploring the highlands from their coastal outposts.<sup>3</sup> People probably gathered plant resources and hunted the mega-fauna, and, more long term, sought pastures for their cattle and lands to expand their cultivation. Human expansion around the world is associated with increases in landscape burning, and in the highlands, a ten-fold increase in fire over previous natural levels has been documented between AD 600 and 800. By a few centuries later, AD 900 to 1200, archaeological paleo-ecological and archaeological evidence from the highlands suggests that cattle begin grazing and cultivated crops appear: essentially, the first people had settled permanently. Owing to the altered fire ecology and cattle grazing, grasses replaced woody vegetation across the highlands, and dominated the landscape after AD 1100.<sup>4</sup>

The first highlanders, probably arriving from the West, are thought to have combined transhumance with horticulture. A second wave of settlement took place early in the second millennium, arriving, it is thought, in successive waves of colonisation from present-day Indonesia. By the thirteenth and fourteenth centuries, evidence of their well-established villages is widespread, particularly in central Imerina. When these settlers arrived in the highlands, they found a largely grass-dominated landscape. They continued frequent burning and cattle herding on the vast hills, and introduced irrigated rice-based agriculture to the floodplains and valleys, altering a variety of wetland and riparian habitats.<sup>5</sup>

Centralised political structures emerged in number of highland locations during the second millennium, notably in the floodplains of the Ikopa River (around Antananarivo), of the Andrantsay River (near Betafo), and the upper Matsiatra River (Lalangina, near present-day Fianarantsoa). Oral histories and archaeological evidence of fortified hill towns suggests a history replete with power struggles and conflicts, both within the region and against outsiders, including the powerful Sakalava kingdoms of the west coast. Slavery was common in these stratified societies, and central to the labour required in irrigated rice cultivation. Regional as well as long-distance trade was present from the earliest days – pottery from east Asia was in use 700 years ago – and by the eighteenth century, the region exported silk, iron, side arms, textiles and agricultural products such as rice, and imported firearms, raffia, salt, cattle, textiles, opium and jewels. Trade in slaves was also prevalent during this period. By the nineteenth century, highly developed rice fields covered the large plains and river valleys. More populated areas also had extensive hillside cropfields, planted with a diversity of New World and Old World cultivars.<sup>6</sup>

At the beginning of the nineteenth century, the rulers of central Imerina, Andrianampoinimerina and his son Radama I, embarked on military campaigns to unify Imerina and conquer much of the island. By the 1820s, the entire highland region was under Merina control, including the (at the time) sparsely populated northern Betsileo region, as well as the Betsileo heartland further south. Under the Merina state, north Betsileo began to be intensively settled and politically organised. By the late 1800s, the control of the internationally recognised Merina state extended to three-quarters of the island. Despite 200 years of central rule (first under the Merina kingdom, then colonial French control, and now the modern Malagasy state), pre-unification political divisions in

the highlands are still visible in the landscape. For example, the former ‘no-man’s-lands’ between the different Betsileo kingdoms remain less densely populated than central areas, with larger land holdings per household, non-diversification from rice and more forested areas. Likewise, the middle-west – a historical no-man’s-land separating the highland people from their Sakalava enemies to the west – remains sparsely populated.<sup>7</sup>

France annexed Madagascar as a colony in 1896. The French intended to establish a profitable colonial economy linked to agricultural production and resource extraction, and their policies reflect that goal. They abolished slavery and worked to develop a modern transportation infrastructure, including roads and railroads. In the populated central and southern highlands, farmers’ traditional property rights over their permanent cultivated plots were confirmed, but at the expense of heavy-handed requisitions for rice production. Land concessions to French colonists remained small in these central areas, but the sparsely settled middle-west saw the establishment of some large colonial farming and ranching concessions. The colonial state also sought to regulate the use of uncultivated lands, restricting the use of fire for pasture maintenance and forest clearance and initiating a variety of tree-planting schemes.

In 1960, Madagascar regained its independence. Over the years, a number of policies promulgated under successive governments have affected highland farmers and landscapes. These include initiatives such as improved rice cultivation techniques, government-run demonstration farms, sponsored migrations to the empty lands of the middle-west, forced tree-planting efforts and centralised crop-marketing boards. However, the central characteristics of most rural villages’ farming practices have remained the same. A typical highland agricultural system is still centred on intensive smallholder production of wet rice (the preferred staple) in floodplains and valleys, and a variety of dry-land crops such as corn, cassava, sweet potatoes, beans, fruit trees and market vegetables. Livestock, especially zebu cattle, graze on pastures and fallow fields. The slave, commoner and nobility distinctions of pre-colonial days still influence economic and cultural life; yet on top of this, new rural elites have emerged based on wealth from market-orientated cropping or urban salaries. Sharp divides remain between land-poor farmers, consigned to sharecrop or work for wages, and others who have amassed considerable holdings. People increasingly move to cities, especially million-strong Antananarivo, to seek economic opportunity, but this has not yet reversed a trend of growing rural populations.<sup>8</sup>

## Dominant Views of Landscape Change

Clearly, the highlands have been shaped by dynamic and complex ecological and social forces. I propose to simplify this complexity through a five-part classification based on existing landscape patterns. Before presenting the categories, however, one needs to reflect critically about how such landscape classifications come about. Like any form of classification or typology, the landscape types do not exist ‘in nature’, but are productions of one’s mind that one uses to help one understand the complexities of the world. There

are often competing classifications, representing different purposes, world views or theoretical understandings.<sup>9</sup>

For example, consider three key types of classifications of relevance to the case of highland Madagascar. The first arises out of the work of Boserup, and focuses on landscape change resulting from demographic change.<sup>10</sup> According to this model, if other factors (such as large-scale colonial land appropriation) are absent, increasing population density leads to an intensification of agriculture – from fallow-based systems to intensive multiple cropping – that is accompanied by growth in markets and transformed land tenure institutions. Such patterns of change have been documented across the world.<sup>11</sup> Someone looking through this frame would classify landscapes in terms of levels of intensification and describe accompanying demographic, market and land tenure indicators. Several authors have followed this approach in describing agricultural land use change in Madagascar.<sup>12</sup> They show that as populations expand, land use intensifies and people seek to bring new land under cultivation, thus migrating to the open lands of either the hilltops or the middle-west. Market opportunities afforded by urban consumers further fuel intensification and expansion, just as government policies facilitate migration to new land.

Rakoto Ramiarantsoa calls the style of agricultural intensification and expansion found at the margins of the central highlands “*mérinisation*”.<sup>13</sup> His term, referring to the progressive transformation of open land to a Merina cultural landscape, imbues the Boserupian process with a cultural symbolic role. Emphasising cultural or historical aspects is a second approach to classifying landscapes. This approach focuses on how landscapes register historical events and trends, as well as cultural preferences for certain landscape features (such as hedges, crop types, field layout and house architecture). Cultural geographers, among others, have long been interested in understanding how landscapes are produced, constructed or contested by a variety of social, economic and cultural processes over time.<sup>14</sup> As an example, the differences in rural farmscapes in Quebec, Canada – between the francophone St. Lawrence Valley and the anglophone Eastern Townships – reflect settlement histories, cultural distinctions and economic differences.<sup>15</sup> A purely cultural approach, which describes landscapes by their regional or ethnic architectures and farmscapes, is reflected in Madagascar, for example by the coffee-table picture book of Christiane Ramanantsoa et al.<sup>16</sup> In a related vein, Sherry Olson has investigated the cultural roots of architecture in the highlands, showing how ‘landscapes of risk’ associated with cyclones, locust plagues or crop diseases are expressed through astrology and architecture.<sup>17</sup>

A third approach reflects an environmental view and focuses on the impact of humans on natural resources such as vegetation and soils. In describing landscape transformations in an area experiencing Boserupian intensification, it might analyse forest loss, fragmentation of habitats and soil degradation instead of changes in the agricultural economy. Such ecological trends have been widely documented globally,<sup>18</sup> and maps and typologies of, for example, ‘intact natural vegetation’, ‘secondary forest’ and ‘degraded vegetation’ are common. In the context of the Malagasy highlands, commentators have analysed landscape change through such an approach, focusing on forest loss and fragmentation,<sup>19</sup> rangeland degradation,<sup>20</sup> and soil degradation through fertility loss and gullying.<sup>21</sup>

## Tantsaha Perspectives on Landscape Change

Lost or forgotten in these contrasting outsider views are the views of the *tantsaha* themselves. One way of approaching *tantsaha* conceptions of landscape change is through language, for how people speak about landscapes and space will reflect cultural rules and mores.<sup>22</sup> The *tantsaha* have many categories for landscape units – from *tanety* (loosely, hills) to *tanimbary* (rice fields), from *lohasaha* (first order valley) to *baiboho* (floodplain), from *tany mena* (red soil) to *tany mavo* (yellow soil).<sup>23</sup> Two authors in particular, Blanc-Pamard and Rakoto Ramiarantsoa, have made impressive efforts to chronicle an ‘ethno-agriculture’ of *tantsaha* understandings of natural and cultivated landscape features and the processes that create them.<sup>24</sup> They present and analyse the terminology used by farmers to describe different hill slopes, soils, springs and sacred sites.

For the current purposes, language is also instructive at a more general level, in relation to larger-scale processes of landscape transformation such as the colonisation of new land. Highland farmers frequently refer to wide-open landscapes with obvious appreciation, calling them *malalaka* (open, spacious) or *mazava* (clear).<sup>25</sup> Several times, when gazing onto the sparsely settled high plateaus or western plains, my informants would exclaim that the land was *mbola malalaka*, still open with room to settle.<sup>26</sup> To illustrate, a family I interviewed in a new hamlet in a high grassland above the Manandona valley stated that they came to “this deserted and open land here” (“*tany malalaka eto an’efitra eto*”) to escape the crowding in the valley below.<sup>27</sup>

The noun *efitra*, used in the quotation above, is another relevant landscape term. It is used generally to refer to vast, open grasslands, and commonly translated as desert, wilderness or wasteland.<sup>28</sup> Norwegian missionaries translated it with the word *ørken*, or ‘desert’; missionary J. Smith placed this label over unpopulated, empty grassland zones in his many maps of the highlands.<sup>29</sup> Instead of ‘desert’, which has connotations of aridity, a better translation of *efitra* in this context might be ‘deserted’, in the sense of a lack of people. The Malagasy term *efitra*, then, seems to reflect pre-nineteenth century English use of the term ‘wilderness’, which at that point was associated with barren wastelands that had not been ‘improved’ by humans.<sup>30</sup>

Other instructive terms include, for example, *tany madio*, or clean land, referring to a landscape kept free of bush encroachment through regular burning.<sup>31</sup> I mentioned *tany vonjena*, or saved land, above; a similar term is *tany vakilo*. This signifies land cleared and cultivated for the very first time; literally it means ‘land of which the head has been split open’. An associated verb is *mamolaka* (passive *folahina*), meaning the action of cultivating land for the first time. Literally, it translates as ‘to be brought into submission’ or ‘to break or to harness for work’.<sup>32</sup> Such terms give outsiders a window into *tantsaha* conceptions of landscape change, as the terms themselves reflect the transformative and productive processes in which the *tantsaha* are engaged. As noted below, they helped me establish a classification of landscape types.

## Five Landscape Types for Highland Madagascar

I find it useful to see the highlands in terms of five broad landscape types: (1) pre-human, (2) open, (3) saved, (4) productive and (5) institutional. My case for using this typology rests on a number of justifications: it is sympathetic to a *tantsaha* perspective on landscape change, to the lived experience of farmers. As noted above, they see landscapes as *malalaka* (or open, available for use), as *tany vonjena* (or saved land) and as *tanimboly sy tanimbary mahavokatra* (productive ricefields and cropland). Thus three categories – open, saved, productive – reflect the fundamental steps of traditional rural land use change associated with settlement and growth. They characterise the vast majority of lands in the highlands. The institutional category reflects land outside traditional use, sometimes in opposition to *tantsaha* livelihoods, typically created through the power of larger institutions like the state. The second reason for using this typology is that each category reflects a combination of agroecological, demographic, economic, tenurial, cultural and political factors that gives it some logical consistency. Each builds on elements of both Boserupian, environmental and cultural approaches, adapting them to the particular story of the Malagasy highlands. I describe each category in turn below, beginning with an illustrative ‘vignette’.<sup>33</sup>

### ***Type no. 1: Pre-human landscapes***

A gorilla-sized lemur ambles across the woodland clearing as an elephant bird grazes on the grasses. The lemur crosses the dense forest of a stream valley, through more woodland over an exposed, high rocky ridge, towards another hollow of dense forest. From the ridge, where grasses and heath wave in the wind, one can see vast woodlands and savannah woodlands of varying openness, interspersed with riparian forests and marshy wetlands.

Pre-human landscapes are the only category without any human influence. After a millennium of human presence, they no longer exist. Paleoecological research suggests that they were characterised, as I described earlier in detail, by a mosaic of woodlands, savannahs, riparian forest, montane forest and heathland. The specific composition and distribution of these vegetation types, shaped in the shorter term by lightning fires, grazing mega-fauna and periodic cyclones, changed over the longer term in response to fluctuating climate conditions.<sup>34</sup>

### ***Type no. 2: Open landscapes***

Sitting on a rocky outcrop on the ridge, the young man surveys his herd of cattle while strumming tunes on a kabosy. The cattle graze on the green sprouts of horona, vero, and danga grass that emerged after the young man’s uncle burned the pasture just before the first rains of October. The herder takes his cattle up here most days in the warm season, taking turns with his brother. Once the grass is high near the village, and especially once the rice is harvested, he will leave them down there to graze on field edge grass and rice stubble. When he has time, he returns to the hills alone with his dog



to hunt trandraka (tenrec, a large insectivore) in the patches of forest in the high hollows. A few times he sets out with Rasalama, his aunt, who goes to collect mushrooms and medicinal plants.

Open landscapes include the uncultivated woodlands, forests and especially grasslands that dominate large portions of the highlands. These are the free, unclaimed or wide-open landscapes – or *tany malalaka*. They are also sometimes referred to as *tany lavavolo*, literally ‘long-haired land’, uncleared land held communally by villages.<sup>35</sup> Land use is extensive, in the sense of low inputs and outputs per unit of land. People harvest the resources that are seasonably available: they use the grasslands as pasture for their cattle; they collect fruit, insects and medicinal plants from the woodlands and forests.

Open landscapes technically belong to the state, as *terre domaniale*; in practice they are loosely managed as common resources of nearby villages.<sup>36</sup> Cattle grazing, periodic fire and resource collection are the chief management tools. Grazing removes plant biomass and favours certain species. Burning serves to prevent bush encroachment, renew pastures and guard against catastrophic wildfires. In some woodlands, such as the *tapia* forests, fire serves to shape vegetation composition.<sup>37</sup> Various forms of resource collection, including tree cutting, plant gathering, fishing and hunting, affect the structure and functioning of remaining vegetation and have modified these landscapes from their pre-human state.

When the first people arrived in the highlands, they began the burning, cattle grazing and resource collection that created these open lands. Today, vast areas of the northern, western and southern rims of the highlands remain open, as well as countless hills, ridges and plateaus in the centre. These lands are the reserves from which the *tantsaha* create their farmlands. Some portions, like rocky mountain summits or deep river gorges, are destined to remain forever ‘open’; others are waiting to be settled and ‘saved’.

### ***Type no. 3: Saved landscapes***

Newlyweds Koto and Nora used to live with Koto’s parents and cultivate one of his grandfather’s rice fields. But a few days a week, they would climb for a long hour over the ridge to the plateau and work to carve out rice fields from a well-sheltered hollow. They would arrange family work parties, where others would come to help with the hard labour of creating the flat fields and berms. With some money saved from the previous year’s harvest, they hired some men to help build a dirt-floored, one room adobe house, their first home. Eventually they moved in to this new home and worked on carving out cropfields from the grassy hillsides. When Koto’s younger brother married, he too built a house near the same hollow, and a hamlet was born.

Saved landscapes are portions of formerly open land claimed through the spade or the axe as a *tantsaha*’s cropfield. I choose the name ‘saved’ because, as I mention earlier, some farmers talk of newly tilled soil as *tany vonjena*, land being saved or rescued. The category represents lands undergoing initial settlement and agricultural expansion. A young couple stake out a claim to a valley hollow and slope upstream from their parents, setting up a new homestead; a few migrants take their families to establish a new village in an unsettled valley to the west.

Outside the rice paddies, land use in saved landscapes is often extensive – that is, using few inputs per unit of land. Farmers leave hillside fields to lie fallow in order to regain fertility, instead of putting in the additional labour or capital of intensive fertility management (they can do this, because there is space). As a result, land subjected to the spade is ‘ripe’, *masaka*, as it has not been cultivated, at least for a while. In forest areas along the eastern fringe of the highlands, this implies slash-and-burn shifting cultivation. But generally in such zones, land use is intensifying, and settlement is accompanied by the gradual preparation of permanent rice paddies in hollows and valley bottoms. Along with these agricultural changes comes a transformation of land tenure. Land worked by someone’s spade is no longer communal land; cultivation rights to it (and often to lands uphill from it) now belong to that person and his lineage. If they can demonstrate continued cultivation for ten years, they can even, in principle, claim formal state recognition of their property rights.<sup>38</sup>

Management of these lands is through fire (to prepare fields for tilling, to clear fire breaks, to clean berms and field edges) and through significant labour with spades, axes and hands. Ecologically speaking, saved landscapes submit to a major transformation. The vegetation in crop fields is fully removed and replaced with domestic crops (and of course, associated weeds). Wetland and riparian vegetation, in particular, is lost to rice fields. On hillsides, however, the lying fallow of crop fields may bring back the ‘long-haired’ vegetation cover (*tany lavavolo*) more typical of open landscapes.

Saved landscapes were the first settlement landscapes in the highlands. They are a transitional landscape, at the margins between the open landscapes and the intensively cultivated landscapes described below. Today they are most common towards the fringes of the highlands and in upland areas throughout. Joel Bonnemaison, followed by Chantal Blanc-Pamard and Hervé Rakoto Ramiarantsoa, aptly describe the colonisation of new lands by potato farmers in the hamlet of Andranomangamanga at over 2 000 metres altitude in the Ankaratra range.<sup>39</sup> This kind of in-filling of remaining open lands is a common, ongoing practice. In my own field site in the Manandona valley, several young farmers were building new homes in the open hills, seeking new lands.<sup>40</sup> At the edges of the highlands, especially to the north and west, whole new villages have appeared as migrants colonise new lands.<sup>41</sup>

#### ***Type no. 4: Productive landscapes***

RaJules returns from the market, crossing through the winter stubble of his rice fields and along the hedge of sisal to his hamlet. An ox cart slowly passes by, loaded with rice, making its ‘tock tock’ knocks and grinding wheel rumble. He tells his wife, “You know what I saw? Kazimena sold a lot of mandarin oranges to a collector from the capital, and he earned good money.” Next week, at the market, he inquires about fruit tree seedlings, and acquires a few to plant in a field he used to use for beans. He also speaks with a representative from the mill company who is offering advice to farmers seeking to grow wheat in their unused winter-time rice fields. He has seen Lalao in

the next village over turn a good profit from such off-season crops, so much that she has been hiring RaJules' two sons for labour several months a year.

Productive landscapes, *tany mahavokatra*, are those resulting from intensively cultivated smallholder farms. Almost every square metre is accounted for and serves some direct role. The valley bottoms, flood plains and many hillside hollows are carved out into rice fields. Canals criss-cross the slopes, bringing water and draining fields. Dryland crop fields, orchards, woodlots, cattle stalls and houses cover the rest of the land, where plots are divided by rice field berms, hedges, paths and walls or fences. Such landscapes embody cultural images of productivity, the *tantsaha* surrounded by family and productive crop fields, as celebrated in literature and music.

Productive landscapes result of the significant labour investments only possible in intensive smallholder agriculture: *tantsaha* invest countless hours of work with spades, ploughs and seeds. In some places, like in the floodplains around Antananarivo, the state has long complemented this labour with large-scale irrigation infrastructure. In productive landscapes, winter rice fields do double duty as cattle pasture or market vegetable gardens or wheat fields. These areas are densely populated, sometimes up to 200 people per square kilometre, and are typically well connected to regional markets. Each crop field is privately owned, whether registered officially or through village tradition. Fields may be borrowed, loaned and given within lineage units, but outside transfers involve payment of rents or outright purchases.

In these landscapes, human management through irrigation, composting, fertilisation, weeding, terracing and seeding seeks to create a predictable output of crops to harvest. Thus, the landscapes are nearly exclusively human created, and the natural vegetation, and even most of the vegetation characteristic of open landscapes, is absent. In some cases, however, soil enrichment, multiple seed varieties and home garden tree planting may have increased species richness to a level higher than that found in open landscapes.<sup>42</sup>

This is the landscape associated with many of the original centres of political power. For example, the kingdom of Imerina was closely associated with the productive landscapes of the Ikopa flood plains;<sup>43</sup> the many historical kingdoms of the present-day Antsirabe region developed near the productive agricultural lands of the Manandona and Andrantsay river valleys;<sup>44</sup> likewise for the southern Betsileo monarchies.<sup>45</sup> Today, such productive landscapes are widespread throughout the central highlands, with varying degrees of intensification. To illustrate, imagine a drive south from the productive rice fields of Antananarivo along Route Nationale 7. At Ambatofotsy, just outside the urban reach of the capital, the plains of the Sisaony river are fully developed for rice cultivation, and in winter many fields do double duty producing strawberries for the urban market. Around Ambatolampy, valley bottoms all sport rice, while hillsides are fully utilised for dry land crops, intensive dairy cattle raising, and woodlots of mimosa and eucalyptus.<sup>46</sup> Further south, other notable spots include the rice-producing and carrot-exporting plain of Ambohibary-Sambaina,<sup>47</sup> the Manandona valley with its winter wheat and barley fields, and the Ambositra-Andina region with its rice terraces and orange orchards.<sup>48</sup>

### *Type no. 5: Institutional landscapes*

Remy, a forester, crosses the crest of the hill on his motorcycle. Ahead is a typical landscape of hamlets with their red-brick houses, rice fields and tanety crops. But on the right, the hills are wonderfully dark green, a uniform patch of deep forest. He bounces down the dirt road, stopping at the forest edge. He steps into the forest, and it is another world – straight rows of pines, the soil covered with duff. Over the ridge, he discovers that the report from the office is true – a good portion of forest had burned, damaging the trees. He finds the village leaders, and inquires about the fire, but hears nothing useful. As usual, they claim ignorance about the fire’s causes and insist that “[w]e fought hard to fight the fire”. In the forest he finds the traces of some illegal tree cutting: villagers are allowed to take dead branches for firewood, but cutting whole trees technically requires a permit.

Institutional landscapes are not shaped by *tantsaha*, but instead by institutions as varied as colonial projects, government ministries, commercial industry and urban investors. From a *tantsaha* perspective, they are new, modern landscapes with non-local, sometimes global influences. They represent strong economic or political forces.<sup>49</sup> They are, in many ways, the opposite of smallholder farmer landscapes, and in some instances lead to conflict with the *tantsaha*. Examples include large cities, forest plantations, colonial concessions, state farms, industrial estates and protected areas. Such examples are admittedly diverse, yet they are unified in that they are not directly shaped by the *tantsaha*’s own match, spade or axe.<sup>50</sup> The area covered by institutional landscapes in highland Madagascar is relatively small when compared, for example, to the countries of eastern and southern Africa. There, the remnants of important settler colonies leave a landscape dominated by large properties, often consisting of commercial agricultural farms or private game farms. Smallholder landscapes developed on former ‘native reserves’ cover just a portion of the landscape. By contrast, smallholder farm landscapes dominate Madagascar. Nevertheless, there are pockets and islands of institutional landscapes of all kinds.

Forest plantations are a key example.<sup>51</sup> The Malagasy Water and Forests Service (Direction des Eaux et Forêts (DEF)), founded at the dawn of French colonial control, oversees a number of forest stations and forest plantations. The largest highland plantation zone is the Haute Matsiatra, near Fianarantsoa, planted in pine. Other forestry stations, such as Manankazo (near Ankazobe), Manjakatempo and Antsampandrano (on the Ankaratra massif) and Angavokely (east of the capital) also oversaw important reforestation projects. Their missions continue to evolve – several have recently been leased to private operators for ecotourism development. Nearly universally planted in exotic pines and eucalypts, these official DEF plantations are joined by hundreds of smaller forests planted under DEF guidance, but under local control. *Tantsaha* usually have few access rights to these forests, aside from the collection of dead branches for fuel. Some bemoan the loss of formerly open landscapes useful as rangeland. In fact, frustration with government policies has often led to state forests being targeted for acts of arson – including Manankazo and the Haute Matsiatra.<sup>52</sup>

Pine and eucalyptus forests now extend far beyond the boundaries of state and communal forests, serving as important sources of charcoal and construction timber for urban markets. ‘Artificial’ forest plantations now cover some 316 000 hectares on the island.<sup>53</sup> Most of the hills in a broad swath east of the capital, from Lake Mantasoa north to Anjozorobe, are covered in private eucalyptus woodlots<sup>54</sup>; similarly, large mountain areas both north and east of Antsirabe (on the roads to Faratsiho and Soanindrariny, respectively) are wooded with pines. The wood fuel and construction wood market leads urban investors as well as some rural *tantsaha* to appropriate open state domain, gaining official title to the land by reforesting it, with the goal of harvesting charcoal or construction timber.<sup>55</sup>

A second example of institutional landscapes is large-scale commercial agriculture. Historically, this included colonial agricultural concessions, such as farms established outside Ambatolampy and Antsirabe, and state-led resettlement projects, such as the 1950s scheme that installed some 200 farmers from La Réunion in the Ankorondrano-Sakay region. Post-independence state-led projects also affected scattered locations, such as the MAMISOA soy-bean cultivation project outside Mandoto or the large-scale apple orchards at Betampona, east of Antsirabe. Finally, agricultural research and training stations furthered the goals of commercial agriculture and ranching. Examples include the Kianjasoa research station towards Tsiroanomandidy, or the Norwegian-sponsored projects north of Antsirabe such as FIFAMANOR and the Tombontsoa farm school. All of these examples have in common a landscape of large fields, often ploughed by tractors. To this day such large-scale commercial agricultural landscapes remain unusual sights in the Malagasy highlands. When they were established, some *tantsaha* were inevitably dispossessed and this often led to conflict.<sup>56</sup>

Third, cities and industrial estates are also institutional landscapes, in that they are overwhelmingly created by administrative, political and large-scale economic institutions. The airports, grand avenues, buildings and commercial centres of cities create new, modern landscapes far removed from rural smallholder farmers. Industrial landscapes similarly represent modern, non-local influences. These are often in cities, but sometimes outside, such as the former SoMaCim (currently Holcim) cement factory at the northern foot of Mt. Ibity, and the Tiko food processing plants north of Antsirabe and around Manjakandriana. Again, *tantsaha* play little role in the creation of these landscapes, aside from service as labourers.

Finally, protected areas such as nature reserves are another category of institutional landscape. There are two official protected areas in the highlands: Ambohitantely special reserve in the north and the Andringitra national park in the south, and two additional ones just outside the limits of what I have defined as the highlands: Ambohijanahary special reserve in the Bongolava range west of Tsiroanomandidy, and Ranomafana national park on the escarpment east of Fianarantsoa. Established by government decree, these protected areas are managed for the purposes of conservation, research and/or tourism. They come under the control of the parastatal agency Association Nationale pour la Gestion des Aires Protégées (National Agency for the Management of Protected Lands) in the case of

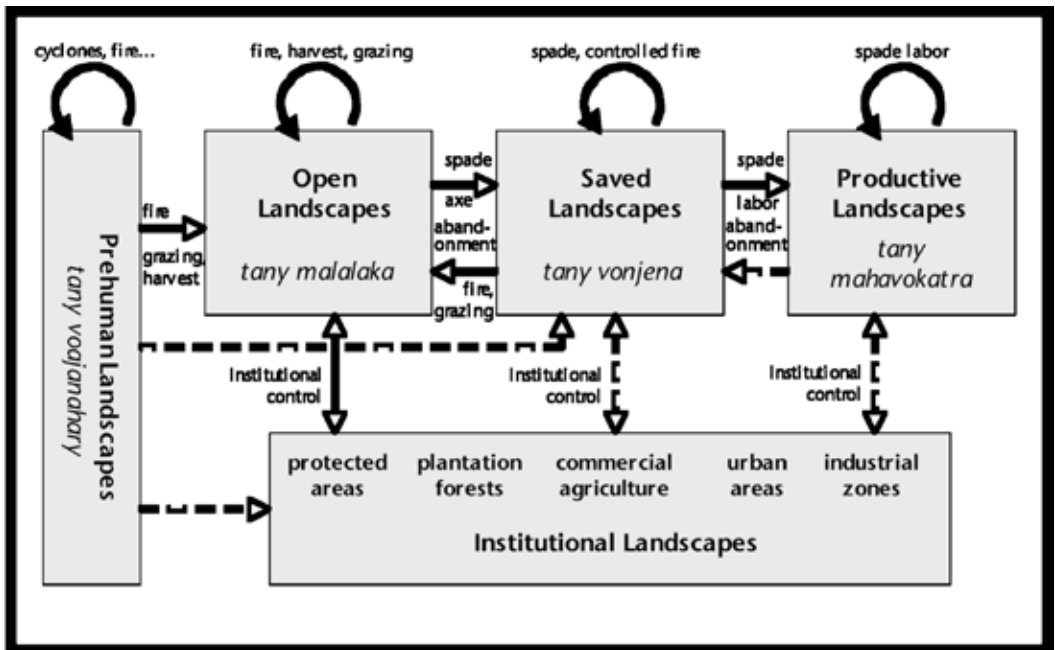
Andringitra, management was entrusted from 1994 to 2005 to the World Wildlife Fund/Worldwide Fund for Nature (WWF).

In addition to these standard protected areas, one should also mention the lands under Forest Service control around the highlands, especially the Manjakatempo forest and Pisciculture station (which includes the Ankaratra high peaks), the Itremo classified forest, and a chain of reserved and classified forests all along the eastern escarpment of the highlands.<sup>57</sup> A number of new protected areas have been proposed in some of these Forest Service lands, as well as in state domain lands. These include Itremo, the escarpment forests of Anjozorobe and Zafimaniry, and the Ibity massif.<sup>58</sup>

Outside influences have always played an important role in such protected areas and forest domains, from the early twentieth-century conservation activism of French botanist Henri Humbert through present-day lobbying by international conservation organisations. These places would otherwise fall into the category of open landscapes, for they are generally influenced by human activities like burning, grazing and resource collection, though not always very obviously. The management of these landscapes, which is much more hands-on in established protected areas (e.g. in Andringitra) than in Forest Service land or proposed protected areas (e.g. in Itremo), often seeks to remove one kind of human influence (*tantsaha* and their fires, cattle and axes) and replace it with another kind of human influence (ecological managers, tourism). In this way, formerly open landscapes became out of bounds to *tantsaha* as they become sites for nature conservation, scientific research and tourism, not surprisingly leading to tension at times.<sup>59</sup> *Tantsaha* must negotiate continued access to resources – see, for example, the agreements about grazing rights in Andringitra national park<sup>60</sup> – and generally foreclose any opportunity to cultivate on the land. Recent government initiatives, however, make possible the establishment of ‘*sites de conservation*’, a category of protected area that specifically tolerates certain forms of *tantsaha* land use.

## Patterns and Processes of Landscape Transformation

The five categories – pre-human, open, saved, productive and institutional landscapes – describe patterns, but also imply the processes that lead from one to another. Figure 6.2 presents a schematic description of these landscape types and the hypothetical transitions between them. The schema begins with the pre-human landscapes on the left. The top three boxes illustrate common stages in smallholder farming and herding societies, with transitions following – more or less – the processes outlined by Boserup 40 years ago. The bottom box lumps the diverse institutional landscapes, all of which differ from the smallholder norm so common across the highlands due to processes shaped by powerful economic and political institutions.



**Figure 6.1** Conceptual model of landscape patterns and processes in highland Madagascar. Boxes represent categories; arrows represent transitions between them. Categories are arranged from left to right along a continuum of increasingly intensive land use.

Not all change is unidirectional. A saved landscape may revert to open landscapes if initial settlement is halted. This was quite common in some areas during the heightened insecurity of the 1980s, when the threat of *dahalo* bandits led many villages to consolidate in one location and abandon outlying fields. On some high ridges above the Manandona valley, for example, one can see ruins of abandoned homes and untended rice fields dating from the 1940s to the 1970s. This process may happen again, for example, if the urban economy takes off and marginal agricultural fields are abandoned as people out-migrate to better farmland or to the cities.<sup>61</sup> Likewise, institutional landscapes can revert to productive landscapes. Abandoned colonial concessions near Antsirabe were snapped up by local elites and bits sold off to former labourers, a process that recreated a productive landscape, but engendered numerous land tenure conflicts.<sup>62</sup>

In some places, institutional landscapes blend with *tantsaha* landscapes. The immense Rochefortaise colonial ranching concession controlled 100 000 hectares south of Tsiroanomandidy. Several villages were founded within its lands by hired hands and their families; they developed rice fields in valley bottoms and created landscapes nearly indistinguishable from lands outside the concession. After independence, part of the concession was nationalised and became a state-run model ranch, Ferme d'Etat Omby. As the ranch's finances and political backing dissolved in the 1980s and 1990s, farmers stole the remaining fences, and the landscape reverted to non-institutional forms.<sup>63</sup>

The proposed classification system is just one possible approach among many to understanding highland landscapes. Yet it is a useful heuristic device and a way of conceptualising the environmental history of highland Madagascar. The five categories are useful, for they specify, at a useful general level of abstraction, the social contexts – demographic, economic and political – that underlie the patterns and processes of landscape change. Furthermore, the classification scheme crucially describes landscapes over at least three different scales of space and time. At each scale – described below – this reinterpretation of the ‘empty space’ on the Madagascar map provides an impressionistic reading of the historical processes shaping different landscapes. It gives a crucial overview that opens the way for deeper investigation of the historical and regional particularities of different places, lives and landscapes.

First, the classification system usefully describes long-term historical processes at a large scale. This *longue durée* perspective conveniently summarises hundreds of years of land use change caused by successive waves of migrants. It was their labour – and that of their slaves – that transformed the first portions of the highlands from pre-human to productive landscapes; *tantsaha* labour continues to expand and intensify agricultural land uses today. Institutional landscapes are a more recent development in this long-term view, associated largely with pressure from outside the realm of the *tantsaha*, including French colonial control, globalised economies and international environmental concerns.

At this scale, the classification scheme invites one to consider the broad forces in landscape history – the ‘tides of history’ as opposed to the foam on individual waves.<sup>64</sup> Holocene vegetation and climate change, the reasons for human settlement and expansion, the struggles between newer arrivals and old, the institutional structures of power and labour control, the flows of trade, the phenomenon of colonisation, the growth and evolution of conservation thought and action: these grand trends visible in the five categories invite further exploration.

When looking at this scale, a conservation manager might recognise that many of the landscapes of interest to him or her are ‘open’ landscapes that owe part of their character to local resource management through grazing, burning and resource collection. The implication is that these landscapes are not pre-human or untouched, and that their management thus needs to take into account the implications for both the *tantsaha* and for the vegetation of restricting such activities. For example, the vegetation of the sub-alpine prairie in Andringitra national park is clearly shaped by fire and grazing. Fire suppression allows woody heath plants to expand at the expense of diverse grasses and herbs. Even some orchids benefit from fire. Restrictions on fire and grazing would thus alter vegetation communities and affect local farmers who used to rely on the sub-alpine prairie as dry season pasture for their cattle.<sup>65</sup>

The *longue durée* perspective also promotes a discussion of sustainable land management, especially with regard to the classification scheme’s important distinction between productive smallholder farm landscapes and institutional landscapes like large-scale commercial farms. While economic logic pushes for field consolidation and gains in efficiency, the sustainability of this approach as opposed to smallholder systems has been questioned.<sup>66</sup>



Smallholder farm landscapes not only embody important images of cultural landscapes, but also, according to Netting, are inherently sustainable and highly productive.

The second story told by the five categories revolves around intermediate time-span processes and events at smaller geographic scales. This is the metaphorical foam on Braudel's tides of history. Every region, every village and every hamlet has its foundation stories – the arrival of a certain ancestor a certain number of generations ago – and experienced the progressive transformation of empty grasslands, thick forests or marshes into productive agricultural lands. In some places the story is fresh, and the process is ongoing, as young farmers carve a homestead for themselves in yet untouched open lands, or as *tantsaha* gradually invest their labour in expanding canal networks, developing rice paddy terraces and planting wood lots. At this scale, institutional landscapes are directly felt and negotiated with. A forest reserve, a quarry, a protected area, a commercial farm – these all affect specific people and specific plots of land, whether in removing a favoured pasture or by presenting a job opportunity.

This intermediate scale comes to light in people's stories and experiences. These invite further exploration of several themes, such as the agroecological logic behind the choices of places for settlement, the struggles of resistance between *tantsaha* and specific institutional landscapes, or the specific agrarian labour relations that underlie the work performed in shaping the landscapes.<sup>67</sup> To take the latter example, the intermediate scale encourages us to ask how the landscapes reflect, say, nineteenth-century slave labour arrangements in Vakinankaratra or today's livelihood struggles of landless farmers in Imerina.<sup>68</sup>

An intermediate scale also invites further consideration of the role of regional interactions and flows. Regional landscapes, after all, are fluid and permeable, "palimpsests upon which overlapping geographic histories are repeatedly inscribed and incompletely erased".<sup>69</sup> No highland farmer, today or centuries ago, is removed from networks of trade that links him or her to other regions, cities or beyond, selling surplus crops and purchasing primary goods. Furthermore, migration is a key facet of highland life. Circular migration to areas of employment, especially as agricultural labour, but increasingly to cities, is common to all regions. Flows of people, money and goods between rural areas and the cities certainly shape the rural landscapes of the highlands, conditioning the types of crops grown, the available labour force or the money invested in houses.

The third scale at which the five-part classification can be used is to understand local differences in landscape patterns at a single point in time. Few places are fully described by just one type of landscape. Nearly every densely populated, intensively cultivated productive landscape has some open land on its periphery; just as nearly every area of open land is dotted with initial attempts to test the soil and prepare the way for saved landscapes: a remote taro field in a mountain hollow over here, a small *tavy* rice clearing over there. Institutional landscapes are also juxtaposed with smallholder landscapes of every type – forest plantations next to terraced rice fields; factories surrounded by market vegetable gardens; quarries in remote open grasslands.

At this fine-grained local scale, one can investigate specific landscapes that are typically labelled as degraded and see how they might be viewed differently through

*tantsaha*'s eyes. A cleared wetland and riparian zone – a definite loss for native flora and fauna – becomes a rice field central to a saved landscape. A tapia woodland torched by an unsupervised bushfire is an open landscape managed through fire for resource collection. Even the most eye-catching examples of environmental change, *lavaka* erosion gullies, defy placement in a potential sixth category of 'degraded land'. This is because, firstly, some *lavaka* owe their existence to natural causes and existed in pre-human landscapes,<sup>70</sup> and, secondly, *tantsaha* sometimes take advantage of *lavaka* hydrology, planting water-hungry crops like bananas inside them, thus turning them into productive landscapes.<sup>71</sup>

At the local scale, one also encounters isolated landscapes that do not neatly fit into the five-category classification scheme. This includes the 'remittance landscapes' shaped by the investment flows from migrants who have made money elsewhere,<sup>72</sup> which are occasionally visible in the presence of a fancy brick villa contrasting with neighbouring mud-walled, thatched roof houses. Such landscapes, while still rare, raise the question of larger-scale regional and international processes that might shape future highland landscapes. Another ill-fitting landscape might be the 'sacred landscapes' of hilltop and hillside tombs, of obelisks and of sacred groves.<sup>73</sup> In some cases, such sacred landscapes receive significant labour inputs, but links to productive agriculture are only indirect or spiritual. In other cases, sacred sites are managed through taboos on cutting or burning. I assert, however, that sacred landscapes usually fit nicely within the five categories proposed here. Tomb sites, in particular, are located on hills at the edge of productive landscapes. The establishment of a tomb in a saved landscape – probably after several generations of presence – is a marker of its conversion to a productive landscape worthy of the label *tanindrazana*, or land of the ancestors.

The categories help one to read highland landscapes through different time periods and geographical scales. They provide a framework to contextualise present-day environmental transformations and to predict and understand future trends, whether continued intensification of smallholder fields, or abandonment of marginal agricultural areas due to migration to cities. They allow one to appreciate the complex human efforts inscribed in the rice terraces, canal systems and hilltop wood lots of the highlands. So, returning to my opening concern about the blank centre on maps of Madagascar, our mission might be to add shadings and hachures that represent different human landscapes to such maps. In this way, lands could be 'saved' not only by protected areas, but also by spades.

## Notes and References

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